IN THE SPECIFICATION:

Please amend paragraph [0032] as follows:

[0032] On the one hand, the present invention creates a method of producing an electronic data set of an average tooth that can be used for producing a dental prosthetic item, a tooth restoration, or a tooth model, according to an example embodiment ~~as is indicated in claim 1~~. In addition, the present invention also creates a method of producing an electronic data set of a generic tooth model that can be used for building up a prosthetic item, a tooth restoration, or a tooth model, according to an example embodiment ~~as is indicated in claims 2 and 3~~. Furthermore, the present invention indicates a method of producing tooth models, dental prosthetic items, or tooth restorations, according to an example embodiment ~~as indicated in claims 4, 5, 9, 21, 22, and 26~~. ~~Claim 8~~ An example embodiment indicates a use of the method of creating a three-dimensional electronic image of the average tooth, or of the method of producing an electronic data set of the generic tooth model. ~~Claim 29~~ An example embodiment indicates a use of a numerically controlled machine for producing tooth models, dental prosthetic items, or tooth restorations, which machine is controlled by a data set that is obtained in accordance with the present invention. Refinements of the method according to the present invention are indicated in other example embodiments ~~the dependent claims~~. ~~Claims 30 and 31~~ Example embodiments indicate a device for visualizing, adjusting, and justifying a generic tooth model data set.

Please amend paragraph [0036] as follows:

Particularly good starting conditions are obtained for the generic tooth model data set. ~~Therefore, the method as defined in claim 2 and the method as defined in claim 1 provide the developed method as defined in claim 3, that on~~ On the basis of a correspondence analysis, a principal component analysis and a linear combination are carried out in the manner described in these embodiments [[claims]], from which a generic tooth model data set is produced. With the assistance of the generic tooth model, it is possible to establish the framework within which it is possible to adjust the model data set to the electronic image of the remaining structure of the tooth to be repaired, without deviating from the supply of natural tooth shapes. The generic tooth model data set can be adjusted to the defective part of the tooth being repaired in an interactive manner or completely automatically using software control and processing. If a numerically controlled machine is controlled in accordance with a data set that is obtained in this manner, the result is a physical tooth part which approximates very well the appearance of the former intact surface of the tooth being repaired, and it is possible to achieve this result in a way that is comparatively simple for the dentist or dental technician.

Please amend paragraph [0037] as follows:

The methods according to example embodiments ~~claims 1 through 5~~ are concerned with creating one or at least very few generic tooth model data sets, or average teeth, of a specific tooth type (eg, upper jaw No. 6, or even large, medium, and small upper jaw No. 6, etc). These surfaces provide adequate tooth-like reconstruction for a number of situations. Furthermore, the generic tooth model data set makes it possible that every modification that is carried out on this surface under specific criteria (see below) results

with high probability in a natural occlusal surface, and that all possible permitted variants of modifications describe the entirety of virtually all of the tooth morphologies that arise in nature. In this context, the number of adjustment variables is small, and the reconstruction of tooth surfaces can be automated.

Please amend paragraph [0042] as follows:

Starting from a reference tooth $z_j(x, y)$, where R∈{1, . . . ,m}, using a correspondence analysis for each point of the reference tooth, the corresponding point on the occlusal surface $z_j(x, y)$ is searched for. This can take place also by linking correspondences in sequence, in that, beginning from one tooth, the correspondence to a further tooth is established, and from this new tooth a further correspondence to a third tooth, and so on. In addition, before every new correspondence determination, a new average tooth can be computed from the available correspondences and can serve as the starting point for the new correspondence analysis. Overall, this can be achieved using an algorithm that automatically locates these correspondences without requiring prior knowledge, according to an example embodiment ~~as is specified in claim 6~~. One possibility is the method of optical flow (for any 3-D objects other possibilities are described in Shelton, C.R.: 3-D Correspondence. Master's thesis, Massachusetts Institute of Technology, 1998). The result obtained is for each tooth $z_j(x, y)$ is a corresponding two-dimensional vector field $\vec{v}_j(x, y)$ where

$$\vec{v}_j(x, y) = \begin{pmatrix} \Delta x_j(x, y) \\ \Delta y_j(x, y) \end{pmatrix}$$

so that for each coordinate pair (x, y) of the reference tooth $z_R(x, y)$, the corresponding point of the tooth $z_j(x', y')$ is generated from the relation:

$$z_j(x+\Delta x_j(x, y), y+\Delta y_j(x, y)).$$

Please amend paragraph [0045] as follows:

One interesting expansion for the computation of the optical flow lies in the fact that, in addition to the three-dimensional data representation z(x, y), other criteria or surface descriptions are consulted for the correspondence analysis, as is indicated in <u>an example embodiment</u>~~claim 7~~. For example, this could be the gradient field of the tooth surface. Better than height data, gradients describe specific features such as edges, corners, or more pronounced changes in the surface. By creating a new feature vector $\vec{m}$ where

$$\vec{m} = \begin{pmatrix} z(x, y) \\ \nabla x(x, y) \end{pmatrix}$$

and introducing a new standard for this feature space:

$$\left\|\vec{m}\right\|^2 = z^2(x, y) + \beta(\nabla z(x, y))^2$$

in which β establishes the weighting of the gradient field in relation to the relief image, the displacement field $\vec{v}(x, y) = (\Delta x(x, y), \Delta y(x, y))^T$ for the feature vector $\vec{m}$ can be computed by analogy to the above, if the standards $\left\|\vec{m}_x\right\|$ and $\left\|\vec{m}_y\right\|^2$, and the respective scalar products $< \vec{m}_x, \vec{m}_y >$ and $< \vec{m}_x, \Delta\vec{m} >$ are used. Of course, it is also possible to conceive multidimensional feature vectors, by taking into account further characteristics of

the tooth surface. These could be, for example, texture values, curvatures, etc. The weighting factor β (or other weighting factors) make it possible to establish the specific influence of the individual feature fields. All of these measures yield a powerful tool, which, for the tooth surfaces, makes possible an automatic analysis of correspondences that does not require prior knowledge.

Please amend paragraph [0048] as follows:

At this point, it is possible to use the new average tooth as a reference tooth, start the above process once again, and repeat it many times. In this way, the average tooth can be determined even more generally. Or various reference teeth are taken and the result is subsequently averaged. In <u>an example embodiment</u> ~~claim 1~~, this average data set is made available as an average tooth of a specific tooth group (tooth type) (FIG. 9).

Please amend paragraph [0050] as follows:

A principal component analysis is available for reducing the number of linear factors β_i and of teeth $\vec{D}_j$. Since each tooth type is recognizable to the person skilled in the art through specific features, those components should have great influence as a result of the principal component transformation in characterizing the specific features of the tooth type. Thus, a sufficient description of most tooth surfaces is obtained using the linear combination of part of the principal component. This principal component analysis can be directly carried out on the tooth data $\vec{D}_j$, as indicated in <u>an example embodiment</u> ~~claim 2~~. The implemented portion p of the resulting principal components (usually those

that contribute most to the variance) are linked mathematically by a linear combination (linear factors a_i and principal components $\vec{P}_i$) as follows:

$$\vec{Z} \approx \sum_{i=1}^{p} a_i \cdot \vec{P}_i \ . \qquad \text{(Equation 1)}$$

Please amend paragraph [0051] as follows:

As indicated in <u>an example embodiment</u> ~~claim 3~~, before the principal component analysis is carried out with respect to the tooth vectors, it is possible to displace the vector space such that the average value 0 is generated. This is obtained by carrying out a subtraction operation between the individual tooth vectors and the average tooth. The differential vectors that are generated can then be analyzed also using principal component methods. Overall, using these methods involving only a few variable parameters, an adequately efficient description of new tooth forms is achieved, which can be represented as linear combinations of these new parameters (linear factors) and principal components. The decisive advantage is that, as the parameters change, one of the existing natural tooth data will be approximated with a high degree of probability. Therefore, the restoration to be created will be very tooth-like, and the risk of obtaining bad occlusal surfaces is eliminated.

Please amend paragraph [0061] as follows:

~~As described in claims 4 and 5~~ <u>According to example embodiments</u>, the reconstruction process for the defective tooth or the defective dental prosthetic item can be carried out using the average tooth, or the generic tooth model, and can also be

substantially automated. Reconstruction signifies the build up or at least partial repair of the missing shell of the defective tooth or of the defective dental prosthetic item. The defective tooth can be an inlay, onlay, overlay, partial crown, crown, bridge preparations, etc, and the defective dental prosthetic item can concern filling out regions of missing teeth, eg, intermediate bridge members, implant structures, or parts of partial prostheses or total prostheses. The concept of remaining dentition condition in this patent specification designates the scanned information (in particular, data sets) of the prepared tooth or teeth (the tooth or defective teeth) or of the defective dental prosthetic item, and the additional optional inclusion of scanned information of the remaining tooth structure, the opposing jaw, the functional and static/occlusal bite registration, the adjacent tooth/teeth and/or the gum component, or the alveolar ridge. The concept of opposing jaw signifies generally only the inclusion of one or more opposing teeth, ie, the tooth or teeth that are opposite the defective tooth or the defective dental prosthetic item. The concept of opposing tooth is synonymous with the technical term antagonist. However, in this patent specification, the term opposing tooth also includes part of the opposing jaw or the entire opposing jaw. If, from the relevant preparation or defective dental prosthetic item and from the surrounding remaining dentition condition, specific construction points, or correspondence points, or correspondence structures are selected, eg, cusp tips or marginal ridge points on the remaining tooth structure and/or possible contact points with the opposing tooth or adjacent tooth (FIGS. 9 to 11), then, assuming knowledge of the relevant correspondence points and structures on the generic tooth model, average tooth, etc, the reconstruction can best be carried out using optimization processes. On the average tooth, rotation, translation, scaling, and, optionally affine transformation parameters are usually generated using

minimization processes. In the case of the generic tooth, there is additional optimized adjustment of the parameters (linear factors) of the principal components such that insertion of the generic tooth, after it has been modified in accordance with the parameters, takes place in an optimal manner. Optionally, it is also possible to build into this process secondary conditions such as limiting the magnitude of the parameters, so that the result does not lie far beyond the tooth space, or the condition that the opposing occlusal surface or functional bite registration should not be penetrated, although it may rest upon the contact points. It is also possible to take into account quality parameters such as minimal layer thicknesses for a material or a surface design having optimal load bearing properties.

Please amend paragraph [0073] as follows:

In an example embodiment ~~claim 8~~, the use of these computed data sets is described for the physical production process. In principle, all possible automated production methods can be used such as CNC milling or grinding, laser processing, stereo lithography, or lithographic sintering methods. The material spectrum for the tooth restoration, dental prosthetic items, or tooth models can range from plastics materials to metals (titanium, gold, steel, etc) to ceramics. In dentistry, a series of materials are currently specially available for the CAD/CAM process.

Please amend paragraph [0074] as follows:

~~Claim 9~~ An example embodiment defines the entire production process from scanning to fabrication. Implementation variants as indicated above can be used here by analogy. From the description and the drawings, a person skilled in the art can derive

further variants that are not indicated here in detail, so that they can also be regarded as being fully incorporated in this patent specification.

Please amend paragraph [0075] as follows:

~~Specific embodiments and explanations with respect to claims 10 through 13 have already been described. Claim 14~~ An example embodiment explicitly relates to taking into account functional and/or static or bite registrations. One great advantage of the entire occlusal surface adaptation using mathematical and electronic methods lies in the fact that it is no longer necessary to go through the entire production chain from taking an impression of the opposing jaw, making a plaster model of this opposing jaw, articulating the opposing jaw and assigning to the sawed model or preparation model, down to determining and justifying the jaw joint parameters, etc. The alternative here represents direct modeling of the opposing jaw position by taking bite registrations in the mouth. The static bite registration, sometimes also known as an occlusal bite registration, is obtained by placing molding material at the desired location, the patient then biting down and leaving the teeth in the bite-down position until the material sets. Information regarding jaw movements is obtained by the patient also carrying out the greatest possible number of different jaw movements before the impression material has set. This then generates the functional bite registration, sometimes also termed the FGP (functional generated path). Using this approach, very precise, three-dimensional information is obtained regarding the pathways of the teeth opposite the preparation, and therefore also borderlines and design indications as to where contact points may lie, and where the reconstructed tooth surface should not be expanded, ie, where the highest points might be. ~~In claim 15~~ According to an

example embodiment, it is precisely this information that is consulted for determining correspondence and therefore for more precise adaptation of the average tooth, or the generic tooth. Using appropriate mathematical formulations, this information can be included in the optimization or minimization methods in the form of limiting conditions. This condition could be as follows: Contact points are points (interpolation of the point having a secondary derivation equal to 0) that contact the bite registration, whereas the remaining areas of the reconstructed surface may not be contacted.

Please amend paragraph [0076] as follows:

~~Claim 16~~ An example embodiment describes the possibility of automating the process of locating the contact point with the opposite tooth (antagonist). By comparing the static (occlusal) bite registration with the functional bite registration, both of which were taken from the patient for the corresponding situation as indicated above and are located (referenced) as measured data sets in the same coordinate system, the areas in which the one bite registration is at a short distance from the other bite registration, or where they contact each other, are especially well displayed. These areas represent the possible candidates for contact with the antagonists, and no contact lines will be found in the other areas. If it is known where the corresponding contact points are located on the generic tooth surface, or on the average tooth, then it is possible to automate the optimization of the linear factors to a substantial extent.

Please amend paragraph [0077] as follows:

~~In claim 17~~According to an example embodiment, for the approximal surface configuration (eg, position of the approximal contact, extension, etc) and for the selection of the correspondence points or structures (eg, marginal ridges, shapes of the occlusal surface, etc) the scanned information of the adjacent teeth is also included. Similarly, individual points (eg, contact points) or the shape and structures of the opposing tooth can be used for the creation of correspondence, and thus the selection of the best fitting tooth surface can be carried out for the reconstruction of the defective tooth or the defective dental prosthetic item. Similarly, information on the corresponding, symmetrically opposite tooth could be taken into account, because it is often presupposed that these tooth shapes are only mirror images showing great resemblance to each other. In particular, this [[claim]] example embodiment includes the possibility of drawing conclusions concerning the shell to be built up or at least parts of this shell, from the information concerning the adjacent tooth/teeth on the basis of the interrelations that are found, from the principal component analysis or correspondence analysis, to exist between adjacent teeth of the same patient (eg, for creating the generic tooth model of adjacent teeth). One possibility lies in optimizing the parameters of the combined generic tooth model data set when adapting to the adjacent tooth/teeth, while at the same time modifying the tooth surface to be reconstructed, to an appropriate extent. The same method can be used for the opposing tooth, or the symmetrically opposite tooth. In particular, this [[claim]] example embodiment makes reference to the fact that the information regarding adjacent tooth/teeth, opposing tooth and/or symmetrically opposite tooth/teeth can also consist of two-dimensionally scanned data sets. Based on these data sets, it is possible to form conclusions concerning the three-dimensional structure with the assistance of a

corresponding generic tooth model through the optimization of imaging, illuminating, rendering, and/or projecting functions (eg, see Blanz, V., Romdhani, S.: Face Identification across Different Poses and Illuminations with a 3-D Morphable Model. Proc. Int. Conference on Automatic Face and Gesture Recognition, 202-207, 2002) and to use them for the reconstruction. The advantage of this two-dimensional scanning lies in the fact that images or data sets can be created relatively easily, eg, using an intraoral camera or photographic equipment on the patient.

Please amend paragraph [0078] as follows:

~~Claim 18~~ An example embodiment indicates that necessary adjustments can still be carried out if undesirable areas and irregularities are still present after computing the best-fitting generic tooth, or average tooth. Such features may comprise small steps or gaps in the transition region leading to the remaining tooth structure, points that are too elevated and penetrate the bite registration or the adjacent tooth, contact points that are still missing, etc. For this purpose, methods are available that ensure that the modifications remain locally delimited and as small as possible, whilst at the same time producing a harmonious and smooth transition to the unmodified regions. This can be carried out using familiar deformation and/or morphing methods. In addition, under certain circumstances, the missing surface parts such as approximal surfaces, oral and vestibular surfaces can be built up. Possible methods of automatically building up these surfaces are described below. All of these processes can be carried out automatically or interactively. In interactive manipulation, the dentist or dental technician can still optimize the configuration in

accordance with his or her ideas. Usually, this possibility should always be implemented in methods for producing dental prosthetic items or tooth restorations.

Please amend paragraph [0079] as follows:

With the assistance of the generic tooth, various occlusal and functional concepts can be realized. In dentistry there are various theories about where the static and functional contact lines to the adjacent tooth or antagonist are to be found. The generic tooth provides the opportunity to decide, quasi online, which concept is to be preferred and where the contact lines should be (FIGS. 9-11). In this context, for example, the desired contact lines are marked on the generic tooth, the corresponding correspondence points on the bite registration and/or the remaining tooth structure or adjacent tooth, as indicated in <u>an example embodiment</u> ~~claims 19 and 20~~ either once and for all for a specific user or laboratory favoring a specific concept, or alternatively before each new treatment. By adjusting the parameters with regard to the corresponding points, a functionally configured natural occlusal surface is obtained after the minimization methods have been employed. This method functions only when using generic teeth, because in the case of tooth libraries, the best tooth can only be selected if, due to changes in the contact/functional situation, the corresponding reference points of all teeth have to be determined anew, which is an expensive undertaking, given the large number of teeth. On the other hand, in the case of deformation of only one model tooth not created on the basis of a generic tooth and in cases where if the principal component analysis has not been carried out, there can be no assurance that the work will produce a harmonious, tooth-like result.

Please amend paragraph [0080] as follows:

~~Claims 21 and 22~~ Example embodiments describe a method of producing dental prosthetic items, which, proceeding on the basis of 3-D data sets of the opposing jaw situation (FIG. 2) and the preparation (FIG. 1) or multiple preparations, which are referenced to each other, are created in that the most fitting occlusal surface is automatically selected from a tooth library (FIG. 5) after referencing the existing bite registration to the preparation data sets on the basis of the possible overlapping areas (FIG. 3), following the selection of the most appropriate correspondence points (FIG. 4). An error minimization method of the selection and adaptation of a library occlusal surface that is very well-suited for this purpose and does not proceed in an interactive manner is described, eg, in Umeyama (Umeyama, S.: Least Squares Estimation of Transformation Parameters between Two Point Patterns. IEEE PAMI 13(4): 276280, 1991). Subsequently, existing interferences or overcuttings relative to the opposing tooth row and/or adjacent teeth are eliminated, and in the case of inlays, onlays, and any partial crowns, the remaining tooth structure is also taken into account, the missing exterior surfaces are built up (FIGS. 6 and 8), and they are then adjusted to the preparation line such that a virtually smooth, harmonious transition is achieved (FIG. 7). By fusing the exterior and interior surfaces along the preparation line (marginal curve), the dental prosthetic items can then be machined. The first decisive factor is that in comparison with the above-mentioned, familiar methods, as a result of selecting many different teeth from a tooth library, it is not the tooth that is adjusted to this situation but rather a tooth is selected that is already very well adapted to this situation, in which it is then only necessary to carry out very small adjustments, which are therefore less error prone and easier to automate. The second

advantage is the separation of important or complicated parts of the tooth surface from less important or simpler parts. The former involves, eg, the occlusal surface, and the latter concerns the vestibular, approximal, and oral surfaces of the teeth. As a result of this division, it is possible to restrict oneself to better adaptation of the more complicated surfaces obtained from the tooth library, while the exterior surfaces are automatically built up and reconstructed. For the exterior surfaces, it is sufficient to indicate only a few construction points (FIGS. 8 and 16). One implementation possibility is the computation of Bezier, NURBS, or B-spline surfaces, which adjoin continuously and smoothly the corresponding parts of the preparation limit and the border of the integrated library data set and that interpolate the construction points (such as approximal contact or convexities of the vestibular or oral surfaces). ~~Claim 22~~ <u>An example embodiment</u> specifies this method.

Please amend paragraph [0081] as follows:

~~Claim 23~~ <u>An example embodiment</u> specifies how this tooth library can be set up. In this context, it is expedient to have a structure in which a data set, which contains the type and the features that are to be taken into account for the selection, is assigned to each tooth data set either through referencing or through being given an appropriate name. In addition, a library is designed to be made up of tooth surfaces that derive from natural, cavity-free, and intact teeth.

Please amend paragraph [0083] as follows:

~~Claim 24~~ <u>An example embodiment</u> describes a method in which, in creating the generic tooth model data set, the factor of age or degree of abrasion is taken into

account, the tooth library surfaces of a specific tooth type being available in all ages or degrees of abrasion, and the obtained combinations of linear factors and principal components that describe this factor are used in order to optimally adjust the abrasion for the respective remaining dentition condition.

Please amend paragraph [0084] as follows:

~~Claim 25~~ An example embodiment depicts a new way of creating tooth restorations, in which a suggestion for the possible localizations of all contact points with the opposing tooth/teeth (ie, the contact points with the opposing jaw) is determined automatically. For this purpose, a functional bite registration and a static or occlusal bite registration are scanned, and the data sets are referenced in the same coordinate system, so that this system corresponds to the situation in the patient or in the model, and subsequently all areas or points that are at a very short distance from one registration to the other are filtered out. The decisive factor is that no contact points can or should be found outside these areas. Therefore, even the configuration of the contact points can be automated or at least substantially simplified.

Please amend paragraph [0085] as follows:

~~Claim 27~~ An example embodiment describes a method in which the data sets of the average tooth, the generic tooth data set, the reconstructed dental prosthetic items, the tooth restorations, or the tooth models are prepared for the production process by smoothing (filtering) or by special adjustment of the tool or processing geometries. This also includes corrections of the milling machine radius, etc.

Please amend paragraph [0086] as follows:

All the indicated methods are equally appropriate for inlays, onlays, partial crowns, crowns, and bridges. A further advantage, as indicated in an example embodiment ~~claim 28~~, lies in the fact that, on the basis of the reconstructed occlusal surface, it is also possible to achieve a reduced occlusal surface configuration for tooth frameworks, which ensures that the tooth veneer subsequently has an approximately constant layer thickness. This can be achieved by computing the new surface at a constant distance from the reconstructed surface, or by shifting the occlusal surface toward the prepared tooth in accordance with the desired layer thickness, at least by flattening out the area of the cusps and fissures.

Please amend paragraph [0087] as follows:

~~Claim 29~~ An example embodiment describes the use of a numerically controlled machine, by means of which, controlled by the data sets found, tooth models, tooth restorations, and dental prosthetic items are physically produced. In principle, all possible automated production methods can be used, such as CNC milling or grinding, laser treatment, stereo lithography, or lithographic sintering methods. The range of materials for the tooth restoration, dental prosthetic items, or tooth models can extend from plastics materials to metals (titanium, gold, steel, etc) to ceramics. In dentistry, a range of special materials is available for the CAD/CAM process.

Please amend paragraph [0088] as follows:

~~Claims 30 and 31~~ <u>Example embodiments</u> describe devices that make it possible, for the generic tooth model data set, to directly and interactively modify the linear factors of at least the most important principal components using a control device. At the same time, the effect of this change can be observed and analyzed in a graphic display. In FIG. 18, one form of the configuration can be seen. The aforementioned devices can be used, eg, in place of automatic reconstruction and optimization, to provide dentists or dental technicians with the possibility of adjusting the generic tooth model data set to the remaining tooth situation interactively and in accordance with their own concepts.

Please amend paragraph [0089] as follows:

~~Claims 32 through 35~~ <u>Example embodiments</u> describe possible methods that can be used to carry out the complete reconstruction of the occlusal surface without in the process explicitly cutting out remaining tooth structure or having to specifically mark it. Rather, the complete data set of the defective tooth is consulted (FIG. 12). By clicking on a few starting values (correspondence points) on the remaining tooth structure, a suggestion is offered, on the basis of which, for the further iteration or adaptation process, only those correspondence points are considered that are located within a specific distance between the proposed tooth surface and the defective tooth (FIG. 12). The threshold of the distance can also be varied or adjusted. In the reconstruction process, therefore, with a high degree of probability, points located in the cavity or on the ground areas of the tooth surface are not taken into account, or they are not regarded as being significant due to the fact that they are present in small numbers. The advantage of this approach lies in the fact that, as indicated in <u>example embodiments</u> ~~claims 33 and 34~~, it is possible complete up the

preparation line automatically. After the occlusal surface has been successfully reconstructed and adjusted, a search is carried out for the areas in which a transition occurs from smaller distance values (areas where remaining tooth structure is still to be found; here, generally, the reconstructed occlusal surface shows slight deviations) to areas having larger distances (areas where the tooth has been ground or tooth structure has been removed). The preparation limit or at least parts thereof must lie within these transition regions (FIG. 13). This approach can be improved if, in these regions, the locations are sought having the greatest curvature on the surface of the data set of the defective tooth, and these locations that have the greatest curvature are joined in these regions to form a line (eg, FIGS. 14 and 15). In this way, it is possible to conceive a fully automatic process, from reconstruction to identification of the preparation limit. However, it is also possible to advantageously use this as support and for formulating suggestions for further interactive processing by the user.

Please amend paragraph [0090] as follows:

~~Claims 36 through 39~~ Example embodiments suggest an interactive possibility of inputting the preparation limit. In this context, at specific distances, points are clicked on the surface of the electronic image of the defective tooth. This clicking can take place using various control and monitoring elements, eg, computer mouse, keyboard, joystick, or 3-D mouse. A connecting line in space is interpolated between the selected points. In order to obtain points from the scanned tooth surface, the connecting line is projected onto the surface (FIG. 14). In this context, it is decisive that the direction of the projection can be selected for specific sectional areas, or even for each section.

Please amend paragraph [0092] as follows:

~~Claims 40 through 42~~ Example embodiments describe methods that make it possible to locate and to fill in any defective areas that arise in the data set of the tooth restoration or dental prosthetic items. Such defective areas can arise, for example, if the reconstructed occlusal surface, or the reconstructed data set, does not cover the entire milled surface, or the adjustment in the region of the preparation limit was not effected in an error-free fashion, and therefore the data set in this region spreads or has errors (FIGS. 6, 8, 15). Through an automatic comparison of the preparation line with the marginal curve of the reconstructed data set, it is possible, by checking distances, to decide which regions of the lines or curves are situated too far from each other and therefore require filling or buildup (FIG. 15). Since the starting points for the preparation line and marginal curve do not have to be identical, the sections of the marginal curve of interest have to be automatically assigned to the corresponding sections of the preparation limit. For computing the built up surface, it may also be necessary, within the transitional region from one curve segment to another curve segment, to add further points on the respective curves that previously, when checking the distance, could not be assigned to the area being built up and that now make it possible to produce the most continuous possible line for computing the filled-in surface. ~~Claim 42~~ An example embodiment explicitly describes a method of closing these defective areas (see also FIG. 16).